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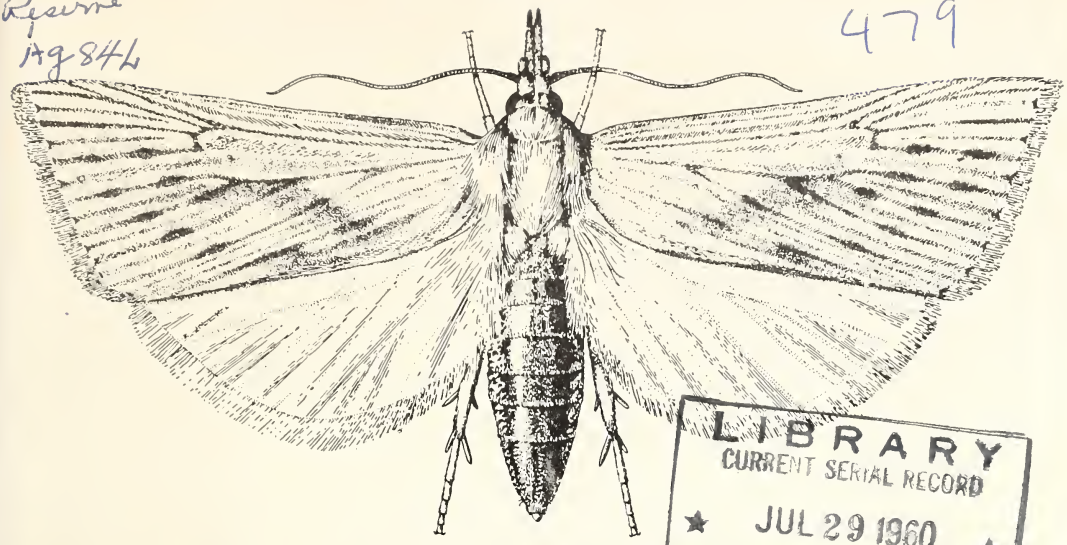

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The Sugarcane Borer

HOW TO CONTROL IT

Leaflet No. 479 U. S. Department of Agriculture

HOW TO CONTROL IT

The sugarcane borer[1] is the larva of a small moth. It occurs in the gulf coast regions of Texas, Louisiana, and Mississippi, and in the southern half of Florida. It attacks sugarcane, corn, rice, sorghums, and a number of wild grasses.

The sugarcane borer causes serious damage. Surveys over a period of 23 years—1935 through 1957—showed that this insect caused a loss of 13 percent of the total value of the sugarcane crop in Louisiana.

APPEARANCE AND DEVELOPMENT

The adult sugarcane borer is a straw-colored moth: each forewing is marked with black dots in a V-shaped design. Its size varies, but averages about an inch from tip to tip of the spread wings.

After mating, the female deposits eggs on the leaves and stems of host plants. Eggs are flat, oval, and about $\frac{1}{20}$ inch long. They are laid in flat clusters of 2 to 100 or more, with an average of about 25 in each cluster. Eggs are creamy white when laid: they become yellowish to orange as the incubation period advances. Before they hatch, the curved bodies of young borers become visible through the eggshells.

In 4 to 9 days, the eggs hatch into larvae. When full grown, larvae are about 1 inch long. They are yellowish white, and have brown spots. In winter, the spots are often absent, and the color is more yellow.

After hatching, larvae feed for a short time on the leaves, in the central whorls of the plants, and inside the leaf sheaths. Then they bore into the stalks and tunnel up and down: occasionally they come out and reenter at other points.

During the summer, larvae within their tunnels transform into pupae after 20 to 30 days of feeding: about

[1] *Diatraea saccharalis.*

9 days later the moths emerge. Pupae are about ⅔ inch long, and 1/16 inch wide. Their color ranges from light brown to dark brown.

The sugarcane borer produces four or five generations in a year. Its life cycle, in the summer, is completed in 30 to 45 days.

The larvae become sluggish when cold weather approaches in the fall; they feed only on warm days.

In Louisiana, Texas, and Mississippi, larvae become dormant in September or October; they pass the winter, and emerge from dormancy and pupate in April. In southern Florida, they are dormant for a shorter period—from November to March.

Sugarcane borers overwinter mostly in cane trash left on the field, in seed cane, in cane stubble, in young plants of summer-planted cane, and in wild grasses. In rice-growing areas, many larvae spend the winter in rice stubble. They overwinter in corn that is late maturing, but few are found in early-planted corn.

DAMAGE TO SUGARCANE

Borer attacks on sugarcane may cause any of the following kinds of damage:

Injury to seed cane.—When larvae bore in stalks, they destroy the eyes. A thin, uneven stand results.

Probably the greatest injury to seed cane is caused by red rot and other rots that develop in the borer tunnels. These rots cause dormant seed pieces to deteriorate severely during wet, cold periods in winter.

Dead hearts in young plants.—Larvae feed in the whorls of young shoots; often they cut through the buds and cause dead hearts. New shoots may replace those that are killed, but the new shoots will be less mature and lower in sucrose content.

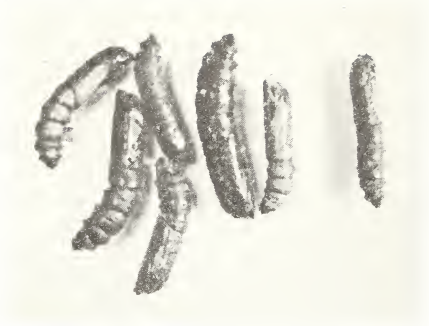
C.& F.—4266

Adult sugarcane borer with wings spread.

Dead tops in older plants.—When borers injure the growing points, further joint formation is prevented. This type of injury may cause the eyes, located on the lower joints, to sprout and produce suckers that are too low in sucrose content to be of value at harvesttime.

Broken-over stalks.—Borers tunnel into the stalks and weaken the supporting tissues; the stalks fall over, or are broken by the first machinery or strong wind that passes through the field. It is difficult for a mechanical harvester to pick up broken stalks; much of this cane never reaches the mill.

Loss in weight and sucrose.—The feeding and tunneling of larvae within the stalks interfere with translocation of plant food substances. This causes a decrease in the size and weight of



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Pupae of the sugarcane borer.

stalks, and in the amount of juice in the cane. It also causes an increase in the amount of undesirable gums and nonsugars in the juice, and impairs the keeping quality of cane cut for the mill. Loss of sucrose in infested canes is estimated at 10 to 20 percent.

In addition to other damage, tunnels made by sugarcane borers allow easy entry of disease organisms such as red rot and other fungi and bacteria.

C&F–5986

Section of sugarcane stalk, split open to show tunnels made by borer.

DAMAGE TO CORN

Larvae of the sugarcane borer damage corn in much the same way that they damage sugarcane. They tunnel in the stalks, causing dead hearts and weakening the stalks so that they break over.

The larvae may bore through the ear shanks, and into the ears. This allows weevils to enter, and sometimes causes the shanks to break. It may shut off the plant's food supply, and cause poor ear development.

DAMAGE TO RICE

Larvae damage rice by tunneling up and down the rice stalks, leaving only thin walls. When stalks are attacked, they usually remain green before heading. However, when the panicle emerges from the boot of a seriously injured stalk, the glumes—or hulls—turn white; these panicles produce no grain.

Stalks may be attacked by borers

after the panicles are exserted from the sheaths. Then the seeds do not develop normally. Light, immature grains result; they do not mill well, and have poor germination properties.

If panicles are attacked when almost mature, they may be girdled at the uppermost node, leaving the upper part of the stem with little support. When this occurs, the stem is easily broken off at the injured node by wind or harvesting machinery.

CONTROL ON SUGARCANE

Insecticides may be needed, but cultural controls are important in protecting your crop from the sugarcane borer.

CULTURAL CONTROLS

Follow these cultural practices:

- Select borer-free seed.
- Select resistant varieties.
- Break old fields in the fall, or early spring.
- Harvest heavily infested cane as early as possible.
- Cut cane close to the ground when harvesting.
- Burn all cane trash completely.
- Scrap thoroughly for field cleanup.
- Shave heavily infested summer- or fall-planted cane, and destroy plants by burning them during the winter.
- Chop and wrap the middles to destroy many of the borers overwintering in cane trash.

BORER-FREE SEED

Select seed cane that has the least infestation. The use of borer-infested cane for planting often results in poor stands and decreased yields; this is true in both plant-cane and stubble-cane years.

When cane is heavily infested, many of the buds are killed. Or, the reserve food supply of the good eyes may be greatly reduced; then, plants from these eyes may not have enough vitality to reach the surface

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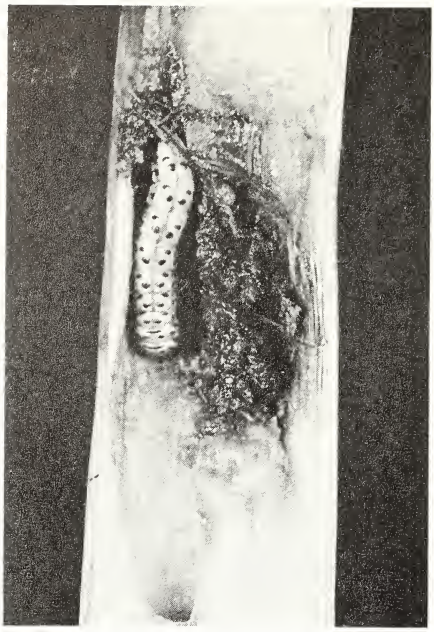
Larva of sugarcane borer, top view. This is the stage that causes damage.



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Borer tunneling in sugarcane stalk.

C&F–5987

Center: Lightly infested variety of sugarcane resistant to the sugarcane borer. Left and right: Heavily infested susceptible varieties.

of the ground, or they may be unhealthy or slow growing.

RESISTANT VARIETIES

Select a variety of seed cane that is resistant to the sugarcane borer. This will help keep damage at a low level if infestations are light; no varieties are resistant enough to escape damage if infestations are heavy.

Among the more resistant commercial varieties are C.P. 52–68. N. Co. 310, C1 38–32, C.P. 34–79, and C.P. 34–120.

CONTROL WITH INSECTICIDE

Apply insecticide if natural and cultural controls fail to provide adequate protection.

When To Apply

Insecticide treatment is recommended to control only the second- and third-generation borers. Make the first application after the joints have started to form, and when at least 2 percent of the plants are infested with young larvae that have not yet bored into the stalks.

Inspecting the fields.—Determine the percentage of infestation as follows:

In each field of 100 acres or less, walk diagonally across it. Examine six "samples" of stalks; make each sample consist of 50 stalks, 1 step apart, along a single row of cane. Space the samples at about the same distance apart across the diagonal path. Cut apart the stalks that show signs of recent feeding by

larvae. If you find an average of one infested stalk per sample, apply insecticide.

What To Use

You can control sugarcane borers by applying endrin. When purchasing, ask for granules containing 2 percent of endrin on 30–60-mesh RVM–AA attapulgite. Apply 12 pounds to each acre. Make four applications at 14-day intervals, and schedule them so the last application is made at least 45 days before harvest.

If you plan to use bagasse or field trimmings for livestock feed, or to pasture livestock in your cane fields, do not apply endrin. Instead, apply a dust containing 40 percent of ryania. Make four weekly applications at the rate of 12 to 15 pounds per acre, unless field inspections indicate that fewer applications are needed. Apply ryania when the air is still, and the plants are moist with dew—usually between 6 p.m. and 9 a.m.

CONTROL ON CORN

To reduce damage to your corn, plant the corn as early as possible, and as far as possible from fields where sugarcane is planted.

You can control sugarcane borers in corn by applying endrin. However, it is not economical to use insecticide for this purpose on most corn crops.

CONTROL ON RICE

The following practices can help you control the sugarcane borer on rice:

- Allow cattle to graze the stubble fields heavily to reduce the number of overwintering larvae.
- Plow rice stubble under in the fall to kill most of the hibernating larvae.
- Close ricefield levees and allow winter rains to submerge the stubble.
- Separate the crops as much as possible if you plant corn or sugarcane in addition to rice.

NATURAL CONTROLS

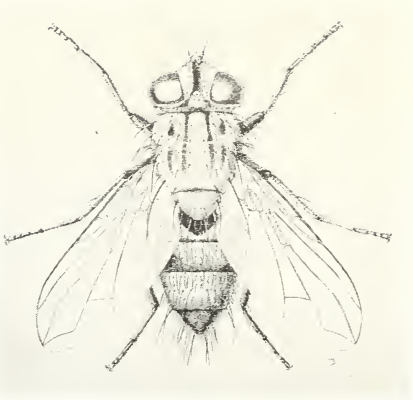
The weather is one natural influence that helps keep the sugarcane borer under control. Few borers survive winter if temperatures are abnormally low and if rainfall is heavy. Late freezes in the spring, after the overwintered borers have become active, help to reduce infestations.

Several species of parasitic insects destroy the borers. One is a small wasp named *Trichogramma minutum*. It lays its eggs in those of the borer, and the parasitic larvae eat the con-

tents of the borer eggs. Attempts have been made to increase the effectiveness of this wasp by releasing it in large numbers early in the year, but the practice has not been successful.

Two introduced parasites—the Cuban fly (*Lixophoga diatraeae*) and a wasplike insect (*Agathis stigmaterus*)—have aided control, particularly in southern Florida.

Natural controls, however, are not always adequate. Good cultural practices, and applications of insecticide, usually are needed to control the sugarcane borer.



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The Cuban fly, a parasite of the sugarcane borer.

PRECAUTIONS

Insecticides are poisonous to man and animals. Follow directions and heed all precautions on container labels. Keep insecticides in closed, clearly labeled containers, in a dry place where they will not contaminate food or feed, and where children and pets cannot reach them.

Endrin is extremely poisonous, and may be fatal if swallowed, inhaled, or absorbed through the skin. It should be applied only by persons thoroughly familiar with its hazards who will assume responsibility for safe use.

To protect fish and wildlife be careful not to contaminate streams, lakes, or ponds with endrin.

Where livestock will be pastured in canefields, or where bagasse or cane tops will be fed to livestock, use ryania instead of endrin.

Prepared by

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